

# KHE Series

- Upgraded capacitance rating
- Endurance with ripple current : 2,000 hours at 105°C
- Rated voltage range : 400 to 450V<sub>dc</sub>, Capacitance range : 210 to 1,500μF
- Non solvent resistant type
- RoHS2 Compliant

KHE

Downsized  
KMZ



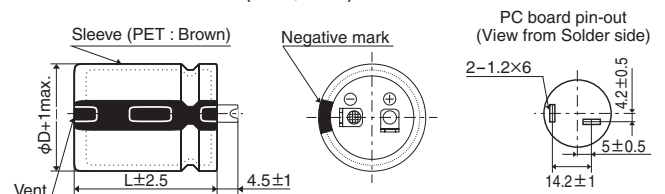
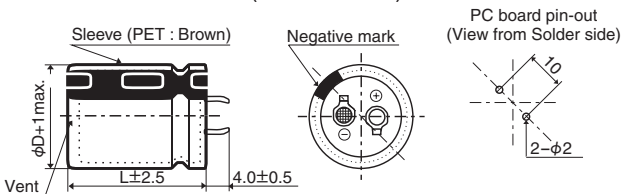
## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |                 |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------|
| Category                                               | -40 to +105℃                                                                                                                                                                                                                                                                          |                                      |                 |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                       |                                      |                 |
| Rated Voltage Range                                    | 400 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |                 |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                              |                                      |                 |
| Leakage Current                                        | I≤3/CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)                                                                                                                                                          |                                      |                 |
| Dissipation Factor (tan δ)                             | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 400 to 450V                          | (at 20℃, 120Hz) |
|                                                        | tan δ (Max.)                                                                                                                                                                                                                                                                          | 0.20                                 |                 |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 400 to 450V                          | (at 120Hz)      |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 8                                    |                 |
| Low Temperature Characteristics (Max. Impedance Ratio) |                                                                                                                                                                                                                                                                                       |                                      |                 |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 2,000 hours at 105℃.                                         |                                      |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤ ±20% of the initial value          |                 |
|                                                        | D.F. (tan δ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                 |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤ ±15% of the initial value          |                 |
|                                                        | D.F. (tan δ)                                                                                                                                                                                                                                                                          | ≤150% of the initial specified value |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                 |

## DIMENSIONS [mm]

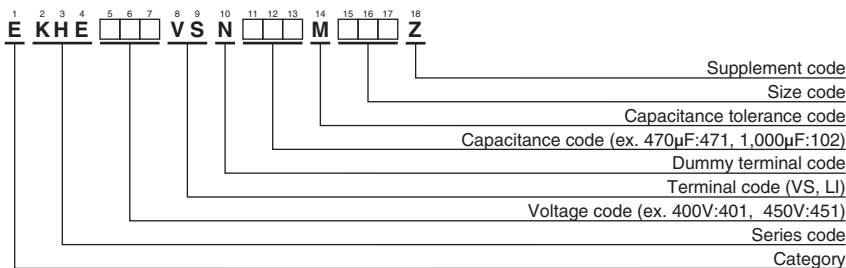
Terminal Code : VS (φ25.4 to φ35) : Standard

Terminal Code : LI (φ30, φ35)



The standard design has no plastic disc.

## PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"



## ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>105°C, 120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tan δ | Rated ripple<br>current<br>(Arms/<br>105°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|-------|----------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|-------|----------------------------------------------------|--------------------|
| 400                      | 240         | 25.4 × 25             | 0.20  | 1.17                                               | EKHE401VSN241MQ25Z | 420                      | 670         | 30 × 40               | 0.20  | 2.15                                               | EKHE421VSN671MR40Z |
|                          | 310         | 25.4 × 30             | 0.20  | 1.37                                               | EKHE401VSN311MQ30Z |                          | 720         | 25.4 × 60             | 0.20  | 2.42                                               | EKHE421VSN721MQ60Z |
|                          | 370         | 30 × 25               | 0.20  | 1.50                                               | EKHE401VSN371MR25Z |                          | 730         | 35 × 35               | 0.20  | 2.00                                               | EKHE421VSN731MA35Z |
|                          | 390         | 25.4 × 35             | 0.20  | 1.60                                               | EKHE401VSN391MQ35Z |                          | 770         | 30 × 45               | 0.20  | 2.36                                               | EKHE421VSN771MR45Z |
|                          | 460         | 25.4 × 40             | 0.20  | 1.77                                               | EKHE401VSN461MQ40Z |                          | 870         | 35 × 40               | 0.20  | 2.26                                               | EKHE421VSN871MA40Z |
|                          | 470         | 35 × 25               | 0.20  | 1.55                                               | EKHE401VSN471MA25Z |                          | 880         | 30 × 50               | 0.20  | 2.57                                               | EKHE421VSN881MR50Z |
|                          | 480         | 30 × 30               | 0.20  | 1.73                                               | EKHE401VSN481MR30Z |                          | 980         | 30 × 55               | 0.20  | 2.76                                               | EKHE421VSN981MR55Z |
|                          | 530         | 25.4 × 45             | 0.20  | 1.94                                               | EKHE401VSN531MQ45Z |                          | 1,010       | 35 × 45               | 0.20  | 2.49                                               | EKHE421VSN102MA45Z |
|                          | 590         | 30 × 35               | 0.20  | 1.96                                               | EKHE401VSN591MR35Z |                          | 1,080       | 30 × 60               | 0.20  | 2.96                                               | EKHE421VSN112MR60Z |
|                          | 600         | 25.4 × 50             | 0.20  | 2.10                                               | EKHE401VSN601MQ50Z |                          | 1,150       | 35 × 50               | 0.20  | 2.71                                               | EKHE421VSN1B2MA50Z |
|                          | 620         | 35 × 30               | 0.20  | 1.81                                               | EKHE401VSN621MA30Z |                          | 1,290       | 35 × 55               | 0.20  | 2.90                                               | EKHE421VSN132MA55Z |
|                          | 680         | 25.4 × 55             | 0.20  | 2.30                                               | EKHE401VSN681MQ55Z |                          | 1,430       | 35 × 60               | 0.20  | 3.07                                               | EKHE421VSN1E2MA60Z |
|                          | 700         | 30 × 40               | 0.20  | 2.20                                               | EKHE401VSN701MR40Z | 450                      | 210         | 25.4 × 25             | 0.20  | 1.10                                               | EKHE451VSN211MQ25Z |
|                          | 750         | 25.4 × 60             | 0.20  | 2.47                                               | EKHE401VSN751MQ60Z |                          | 270         | 25.4 × 30             | 0.20  | 1.28                                               | EKHE451VSN271MQ30Z |
|                          | 760         | 35 × 35               | 0.20  | 2.04                                               | EKHE401VSN761MA35Z |                          | 320         | 30 × 25               | 0.20  | 1.39                                               | EKHE451VSN321MR25Z |
|                          | 810         | 30 × 45               | 0.20  | 2.42                                               | EKHE401VSN811MR45Z |                          | 330         | 25.4 × 35             | 0.20  | 1.48                                               | EKHE451VSN331MQ35Z |
|                          | 910         | 35 × 40               | 0.20  | 2.31                                               | EKHE401VSN911MA40Z |                          | 400         | 25.4 × 40             | 0.20  | 1.65                                               | EKHE451VSN401MQ40Z |
|                          | 930         | 30 × 50               | 0.20  | 2.64                                               | EKHE401VSN931MR50Z |                          | 400         | 35 × 25               | 0.20  | 1.43                                               | EKHE451VSN401MA25Z |
|                          | 1,030       | 30 × 55               | 0.20  | 2.83                                               | EKHE401VSN1A2MR55Z |                          | 410         | 30 × 30               | 0.20  | 1.59                                               | EKHE451VSN411MR30Z |
|                          | 1,060       | 35 × 45               | 0.20  | 2.55                                               | EKHE401VSN1A2MA45Z |                          | 460         | 25.4 × 45             | 0.20  | 1.81                                               | EKHE451VSN461MQ45Z |
|                          | 1,140       | 30 × 60               | 0.20  | 3.04                                               | EKHE401VSN1B2MR60Z |                          | 510         | 30 × 35               | 0.20  | 1.82                                               | EKHE451VSN511MR35Z |
|                          | 1,210       | 35 × 50               | 0.20  | 2.78                                               | EKHE401VSN122MA50Z |                          | 520         | 25.4 × 50             | 0.20  | 1.95                                               | EKHE451VSN521MQ50Z |
|                          | 1,350       | 35 × 55               | 0.20  | 2.97                                               | EKHE401VSN1D2MA55Z |                          | 530         | 35 × 30               | 0.20  | 1.67                                               | EKHE451VSN531MA30Z |
|                          | 1,500       | 35 × 60               | 0.20  | 3.15                                               | EKHE401VSN152MA60Z |                          | 580         | 25.4 × 55             | 0.20  | 2.13                                               | EKHE451VSN581MQ55Z |
| 420                      | 230         | 25.4 × 25             | 0.20  | 1.15                                               | EKHE421VSN231MQ25Z |                          | 600         | 30 × 40               | 0.20  | 2.03                                               | EKHE451VSN601MR40Z |
|                          | 300         | 25.4 × 30             | 0.20  | 1.35                                               | EKHE421VSN301MQ30Z |                          | 640         | 25.4 × 60             | 0.20  | 2.28                                               | EKHE451VSN641MQ60Z |
|                          | 350         | 30 × 25               | 0.20  | 1.46                                               | EKHE421VSN351MR25Z |                          | 660         | 35 × 35               | 0.20  | 1.90                                               | EKHE451VSN661MA35Z |
|                          | 370         | 25.4 × 35             | 0.20  | 1.56                                               | EKHE421VSN371MQ35Z |                          | 690         | 30 × 45               | 0.20  | 2.23                                               | EKHE451VSN691MR45Z |
|                          | 440         | 25.4 × 40             | 0.20  | 1.74                                               | EKHE421VSN441MQ40Z |                          | 780         | 35 × 40               | 0.20  | 2.14                                               | EKHE451VSN781MA40Z |
|                          | 440         | 35 × 25               | 0.20  | 1.51                                               | EKHE421VSN441MA25Z |                          | 790         | 30 × 50               | 0.20  | 2.43                                               | EKHE451VSN791MR50Z |
|                          | 460         | 30 × 30               | 0.20  | 1.68                                               | EKHE421VSN461MR30Z |                          | 890         | 30 × 55               | 0.20  | 2.63                                               | EKHE451VSN891MR55Z |
|                          | 510         | 25.4 × 45             | 0.20  | 1.90                                               | EKHE421VSN511MQ45Z |                          | 910         | 35 × 45               | 0.20  | 2.36                                               | EKHE451VSN911MA45Z |
|                          | 560         | 30 × 35               | 0.20  | 1.91                                               | EKHE421VSN561MR35Z |                          | 1,000       | 30 × 60               | 0.20  | 2.83                                               | EKHE451VSN102MR60Z |
|                          | 570         | 25.4 × 50             | 0.20  | 2.05                                               | EKHE421VSN571MQ50Z |                          | 1,040       | 35 × 50               | 0.20  | 2.58                                               | EKHE451VSN1A2MA50Z |
|                          | 580         | 35 × 30               | 0.20  | 1.75                                               | EKHE421VSN581MA30Z |                          | 1,160       | 35 × 55               | 0.20  | 2.75                                               | EKHE451VSN1B2MA55Z |
|                          | 640         | 25.4 × 55             | 0.20  | 2.23                                               | EKHE421VSN641MQ55Z |                          | 1,290       | 35 × 60               | 0.20  | 2.92                                               | EKHE451VSN132MA60Z |

## ◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

| Frequency(Hz) | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------|------|------|------|------|------|------|
| Multipliers   | 0.77 | 1.00 | 1.10 | 1.21 | 1.32 | 1.33 |

The deterioration of aluminum electrolytic capacitors accelerates their life due to the internal heating produced by ripple current. For details, refer to Section "5-3 Ripple Current Effect on Lifetime" in the catalog, Technical Note.



- Always read "Notes on Use" before using the product in order to enable you to use the product correctly and prevent any faults and accidents from occurring.
- Request the Product Specification on the product of NIPPON CHEMI-CON CORPORATION to refer to it as well as this brochure prior to the order of the products. Some specific notes on use of the ordered product may be described in the specifications.
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In addition, we have an established system with enhanced traceability, therefore we will limit the applicable lot items for any potential compensation.

[Part Numbering System](#)

[Part Numbering System \(Appendix\)](#)

[Standardization](#)

[Available Items by Manufacturing Locations](#)

[Environmental Measures](#)

[Technical Note](#)

[Precautions and Guidelines](#)

[Recommended Soldering Conditions](#)

[Taping, Lead-preforming and Packaging](#)

[Available Terminals for Snap-in and Screw Mount Type](#)